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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,049	02/19/2004	Kari Hooli	872.0178.U1(US)	6796
29683 7590 03/23/2007 HARRINGTON & SMITH, PC 4 RESEARCH DRIVE SHELTON, CT 06484-6212			EXAMINER MATIN, NURUL M	
			ART UNIT	PAPER NUMBER
			2611	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/23/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/783,049

Applicant(s)

HOOLI ET AL.

Examiner

Nurul M. Matin

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 May 2004 and 18 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-12,14-22,24 and 26-33 is/are rejected.
- 7) ☐ Claim(s) 2,13,23 and 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>03/19/2004 & 06/16/2005</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

In page 1, Para [0001], Applicant talked about the provisional Patent Application No.: 60/-. But he failed to disclose the full application number.

Appropriate correction is required.
2. The disclosure is objected to because of the following informalities:

In page 3, Para [0020], line 4 in page 3, says a periodic recalculation for the equalizers 4A and 14B, it should be 14A and 14B.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
4. **Claims 1, 3-6, 10, 12, 14-16, 22, 24, 26-28, 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang, EP 1289182 and in view of Jayaraman et al, US 20040165653.**

Re claim 1, Huang teaches a code division, multiple access (CDMA) receiver having an input node coupled to a plurality S of receive antennas that receive signals from a plurality N of transmit antennas (fig.1, which has multiple receive antennas and multiple transmit antennas), comprising: J correlators outputting soft symbol decisions, where $J=N$ times a number of detected physical channels (fig1&2, where Despreaders works as correlator and has a output which will be soft mapping); equalizers output coupled to as many correlators as there are detected physical channels of the said J correlators(see fig.1, where joint equalizers output is coupled with the despreaders (which is a correlator)); a channel estimator having an input coupled to said input node and N outputs representing a channel estimate for each of said transmit antennas(The process is entered in step 201, in which $L * P$ discrete channel estimations h_0 to h_{Lp-1} are developed. The channel estimate may be obtained using any conventional technique, e.g., by using correlators tuned to the pilot channel, second inputs coupled to said N outputs of said channel estimator, and third inputs for receiving estimates of received chip energy per transmit antenna (page 4, Para [0021], line 4-6, each of discrete channel estimations is taken with a time spacing of the chip duration divided by p, for CDMA, or symbol duration divided by p for TDMA), said unit computing said coefficients so as to operate said equalizers for simultaneously suppressing inter-antenna interference and multiple user interference such that the suppression of the inter-antenna interference and the multiple user interference is balanced with respect to their deteriorating impact on symbol estimates(Also, in step 201, the background noise plus interference power σ^2 and the power of the downlink from the base station to the

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terminal σ^2 are determined in the conventional manner. In step 203, the weights employed by joint equalizer 109 are determined"). But Huang fails to teach a unit for computing coefficients for each of said N equalizers, said unit having a first input coupled to said input node. However, Jayaraman does (page 6, Para [0089], line 1-4, which has multiple equalizers, each having an input coupled ($[y_{sub.m}]$) to said input node) and Para [0092], as shown in fig. 4B, a coefficient computation unit 440 derives a set of coefficients $f_{sub.k.sup.i}$ for each of the base stations in set I).

Therefore, taking the combined teaching of Huang and Jayaraman as a whole, it would have been obvious to one of ordinary skill in the art to incorporate the arrangement of a N equalizers each having an input coupled to said input node as thought in Jayaraman into Huang to provide transmit chip estimates for the associated base station so that it will removes the interference from all other code channels).

Re claim 3, Huang and Jayaraman references teach a CDMA receiver as in claim 1, and Huang references also teaches unit operates at a chip level (page 4, Para [0018].

Re claim 4, Huang and Jayaraman references teach a CDMA receiver as in claim 1, and Huang references also teaches unit operates at a symbol level (page 4, Para [0018].

Re claim 5, Huang and Jayaraman references teach a CDMA receiver as in claim 1, and Huang reference also teaches equalizer coefficients continuously using a least mean squares (LMS) or a recursive least squares (RLS) based algorithm (page 12, Para [0062].

Re claim 6, Huang and Jayaraman references teach a CDMA receiver as in claim 1, and Huang reference also teaches adaptation of the equalizer coefficients is performed at a symbol rate at the output of a correlator bank (page 4, para 0018, line 3-6).

Re claim 10, Huang, Jayaraman references teach a CDMA receiver as in claim 1, and Huang references also teaches CDMA receiver performs equalization at a symbol rate (page 4, Para [0018].

Re claims 12, 14-16 & 22, 24, 26-28, 32, which claim the same subject matter as, recited in claims 1, 3-6 & 10.

Therefore, claims 12, 14-16 & 22, 24, 26-28 and 32 have been analyzed and rejected with respect to claims 1, 3-6 & 10.

5. Claims 7-9, 11, 17-19, 21, 29-31, 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang, EP 1289182, Jayaraman et al, US 20040165653 and in view of Dabak et al, US 20030002568.

Re claim 7, Huang and Jayaraman fail to teach that unit updates said equalizer coefficients periodically at High Speed Downlink Packet Access (HSDPA) transmission time intervals (TTI). However, Dabak does (page 1, Para [0007], line 1-3, "High Speed Downlink Packet Access (HSDPA), has been developed to enhance mobile services for high-speed data users").

Therefore, taking the combined teaching of Huang, Jayaraman and Dabak as a whole, it would have been obvious to one of ordinary skill in the art to incorporate the

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arrangement of a unit updates said equalizer coefficients periodically at High Speed Downlink Packet Access (HSDPA) transmission time intervals (TTI) as thought in Dabak into Huang and Jayaraman for link adaptation such as adaptive modulation and coding to enhance data rates to data users in a time-multiplexed manner.

Re claim 8, Huang, Jayaraman and Dabak references teach a CDMA receiver as in claim 1, and Dabak references also teaches CDMA receiver comprises a Space Time Transmit Diversity (STTD) architecture receiver (page 1, Para [0006]).

Re claim 9, Huang, Jayaraman and Dabak references teach a CDMA receiver as in claim 1, and Dabak reference also teaches CDMA receiver comprises a Double Space Time Transmit Diversity (STTD) architecture receiver (page 5, Para [0062], line 5-8).

Re claim 11, Huang, Jayaraman and Dabak references teach a CDMA receiver as in claim 1, and Dabak references also teaches CDMA receiver operates with one of orthogonal or non-orthogonal space-time codes (page 2, Para [0030, "the use of STTD in combination with orthogonal spreading codes (corresponding generally to C.sup.m (n) above) such as used in conventional CDMA systems"]).

Re claims 17-19, 21 & 29-31, 33, which claim the same subject matter as, recited in claims 7-9 & 11.

Therefore, claims 17-19, 21 & 29-31, 33 have been analyzed and rejected with respect to claims 7-9 & 11.

Allowable Subject Matter

1. Claims 2, 13, 23, 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nurul M. Matin whose telephone number is 571-270-1188. The examiner can normally be reached on mon-fri (7:30-5:00).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Nurul Matin


MOHAMMED GHAYOUR
SUPERVISORY PATENT EXAMINER